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(71) 出願人 000003964

日東電工株式会社

大阪府茨木市下穂積1丁目1番2号

(72) 発明者 中野 一郎

大阪府茨木市下穂積一丁目1番2号 日東
電工株式会社内

(72) 発明者 市川 浩樹

大阪府茨木市下穂積一丁目1番2号 日東
電工株式会社内

(74) 代理人 100101362

弁理士 後藤 幸久

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(54) 【発明の名称】 包装材用積層テープ

(57) 【要約】

【課題】 キャリアテープ等の包装基材に対する熱接着性に優れると共に、湿度の高低によらず又長期間保存しても高い帯電防止性を示し、且つチップ等の被包装物の付着を抑制できる包装材用積層テープを得る。

【解決手段】 包装材用積層テープは、支持基材層上に、ベースポリマー、粘着付与樹脂、高分子型帯電防止剤及び充填剤を含む接着剤層が積層されている。前記接着剤層は、ベースポリマー100重量部に対して、粘着付与樹脂を2～50重量部、高分子型帯電防止剤を1～150重量部、充填剤を5～100重量部含んでいてもよい。前記接着剤層の厚みは、例えば5～50 μ m程度であり、接着剤層の表面抵抗率は、例えば $10^{13}\Omega/\square$ 以下である。



【特許請求の範囲】

【請求項1】 支持基材層上に、ベースポリマー、粘着付与樹脂、高分子型帯電防止剤及び充填剤を含む接着剤層が積層されている包装材用積層テープ。

【請求項2】 接着剤層が、ベースポリマー100重量部に対して、粘着付与樹脂を2〜50重量部、高分子型帯電防止剤を1〜150重量部、充填剤を5〜100重量部含む請求項1記載の包装材用積層テープ。

【請求項3】 接着剤層の厚みが5〜50 μ mであり、接着剤層の表面抵抗率が $10^{13}\Omega/\square$ 以下である請求項1又は2記載の包装材用積層テープ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明はチップ型電子部品の搬送時などに該電子部品等を包装する包装材用として使用される積層テープに関するものである。

【0002】

【従来の技術】チップ固定抵抗器、積層セラミックコンデンサ等のチップ型電子部品を搬送する方式として、該電子部品を包装材用積層テープに包装して搬送するテーピングリール方式が知られている。このテーピングリール方式では、テープ状厚紙の長さ方向に一定の間隔でチップ型電子部品収納用打抜き角穴を形成した紙キャリア（キャリアテープ）の下面をボトムカバーテープで熱シール（テーピング）して収納用ポケットを作製し、その直後にチップ型電子部品を前記収納用ポケットに挿入し、前記紙キャリアの上面をトップカバーテープで熱シールしてチップ型電子部品を封入した後、リール状に巻取られ搬送される。そして、搬送先の回路基板等の作製工程においては、トップカバーテープを剥離後、収納されたチップ型電子部品をエアノズルで自動的に吸着して基板上に供給する自動組入れシステムが主流となっている。

【0003】このようなテーピングから基板へのチップ供給までの一連の工程において電子部品の包装材として用いられるカバーテープ（トップカバーテープ及びボトムカバーテープ）に対しは、チップを確実に供給するため、次のような性能が要求されている。すなわち、

- (i) 紙キャリアに対して良好な接着性を有すること、
- (ii) テーピング作業時及び輸送途中の振動による静電気の発生を抑えたり、トップカバーテープを剥離する際の剥離帯電によるチップのポケットからの飛び出しを抑制する、いわゆる帯電防止性に優れていること、
- (iii) 輸送途中の環境条件（温度や湿度など）に起因してチップがカバーテープの接着剤層に付着しないこと、
- (iv) チップ挿入時やチップ取り出し時にチップがエアノズルなどで押さえられてもボトムカバーテープの接着剤層に付着しないことなどである。

【0004】特に、近年、チップ型電子部品においては軽薄短小化が進み、主力サイズは非常に小さくて軽いチ

ップ部品へと移行してきているため、上記性能のより優れたカバーテープが所望されている。

【0005】従来、トップカバーテープとして、ポリオレフィン系樹脂に界面活性剤を練り込んだ接着剤層が中間層を介して支持基材上に積層されたものが知られている。このカバーテープは、優れた接着性、易剥離性を有しており、帯電防止性においても実用上問題がないため、広く使用されている。また、ボトムカバーテープとしては、基材上に設けられた接着剤層の表面に帯電防止コーティング剤が塗布されたものが使用されている。しかし、これらのカバーテープは、経時的に帯電防止性などの性能が低下し、保存安定性に乏しいという問題を有する。なお、一部では、ポリマータイプの帯電防止コーティング剤を用いるケースもあるが、熱（高温保管）によりチップ部品と付着しやすいなどの欠点を併せ持っている。

【0006】そのため、このようなカバーテープを用いた場合には、紙キャリアに設けられたチップ部品収納用打ち抜き角穴へのチップの挿入から、トップカバーテープの熱シール、搬送、基板へのチップ部品の供給に至るまでの過程で、チップが静電気によりボトムカバーテープに付着して取り出せなかったり、トップカバーテープの剥離の際、該テープの剥離帯電によりチップが飛び出したり、温度環境等によりチップと接着剤層との間に軽微な付着が生じたり、チップがエアノズルで押しつけられてボトムカバーテープに付着するという種々の不具合が助長され、円滑なチップ供給が阻害されるという問題があった。

【0007】

【発明が解決しようとする課題】従って、本発明の目的は、キャリアテープ等の包装基材に対する熱接着性に優れると共に、湿度の高低によらず又長期間保存しても高い帯電防止性を示し、且つチップ等の被包装物の付着を抑制できる包装材用積層テープを提供することにある。本発明の他の目的は、上記の特性に加え、さらに前記キャリアテープ等の包装基材から容易に剥離可能な包装材用積層テープを提供することにある。

【0008】

【課題を解決するための手段】本発明者らは上記目的を達成するため鋭意検討した結果、支持基材層上に設ける接着剤層を特定の成分で構成すると、包装基材に対する接着性、帯電防止性（保存安定性及び湿度依存性）、被包装物の付着防止性の何れをも充足できることを見出し、本発明を完成した。すなわち、本発明は、支持基材層上に、ベースポリマー、粘着付与樹脂、高分子型帯電防止剤及び充填剤を含む接着剤層が積層されている包装材用積層テープを提供する。

【0009】

【発明の実施の形態】以下、必要に応じて図面を参照しつつ、本発明の実施の形態について説明する。図1は本

発明の包装材用積層テープの一例を示す概略断面図である。

【0010】この包装材用積層テープは、支持基材層1と該支持基材層1上に設けられた接着剤層2とで構成されている。支持基材層1を構成する支持基材としては、自己支持性を有するものであればよく、例えば、和紙、薄葉紙、クレープ紙、合成紙、混抄紙、複合紙などの紙；不織布、布；ポリエチレン、ポリプロピレン、エチレン-酸共重合樹脂などのオレフィン系樹脂、ポリプロピレン変性樹脂、スチレン系熱可塑性エラストマーなどの熱可塑性エラストマー、ポリエチレンテレフタレート、ポリブチレンテレフタレート、ポリエチレンナフタレートなどのポリエステル等の熱可塑性樹脂で構成されたプラスチックフィルム又はシート；銅、アルミニウムなどの金属で構成された金属箔又は薄板；これらの積層体などが挙げられる。

【0011】前記支持基材は、融点が90℃以上であるのが好ましい。融点が90℃未満の場合には、例えば金属製アイロンなどを用いて熱圧着によりテーピングを行う際に、支持基材が溶融してアイロンなどに付着し、本来の包装という目的を達成できなくなる恐れがある。

【0012】支持基材層1の表面（接着剤層2とは反対側の面）は、慣用の表面処理、易滑処理、帯電防止処理などが施されていてもよい。また、支持基材層1のうち、接着剤層2側の面には、オゾン処理、コロナ処理などの投錨性を向上するための処理が施されていてもよく、特に支持基材がプラスチックフィルムの場合にはアンカーコート剤塗布による投錨性向上手段が採られていてもよい。

【0013】支持基材層1の厚みは、機械的強度、ハンドリング性などが損なわれない範囲で用途に応じて広い範囲で選択できるが、一般には5～100μm程度、好ましくは10～50μm程度である。

【0014】接着剤層2は、ベースポリマー、粘着付与樹脂、高分子型帯電防止剤及び充填剤が均一に分散された熱可塑性接着剤で構成されている。

【0015】ベースポリマーとしては、例えば、オレフィン系樹脂、酢酸ビニル系樹脂などの熱可塑性樹脂、熱可塑性エラストマーなどを使用できる。これらのポリマーは単独で又は2種以上組み合わせて使用できる。

【0016】前記オレフィン系樹脂としては、例えば、ポリエチレン（低密度ポリエチレン、線状低密度ポリエチレン、メタロセン触媒法ポリエチレン、高密度ポリエチレンなど）、ポリプロピレン、エチレン-α-オレフィン共重合樹脂などのポリオレフィン；エチレン共重合体（例えば、エチレン-アクリル酸共重合体（EAA）、エチレン-メタクリル酸共重合体（EMAA）などのエチレン-不飽和カルボン酸共重合体；アイオノマー；エチレン-アクリル酸メチル共重合体、エチレン-アクリル酸エチル共重合体（EEA）、エチレン-メタ

クリル酸メチル共重合体などのエチレン-（メタ）アクリル酸エステル共重合体；エチレン-酢酸ビニル共重合体（EVA）；エチレン-ビニルアルコール共重合体など）；ポリプロピレン変性樹脂などが挙げられる。

【0017】酢酸ビニル系樹脂としては、例えば、ポリ酢酸ビニル、酢酸ビニル-（メタ）アクリル酸エステル共重合体、酢酸ビニル-ビニルエステル共重合体、酢酸ビニル-マレイン酸エステル共重合体などが挙げられる。

【0018】熱可塑性エラストマーとしては、例えば、SIS（スチレン-イソプレン-スチレンブロック共重合体）、SBS（スチレン-ブタジエン-スチレンブロック共重合体）、SEBS（スチレン-エチレン-ブチレン-スチレンブロック共重合体）、SEPS（スチレン-エチレン-プロピレン-スチレンブロック共重合体）、SEP（スチレン-エチレン-プロピレンブロック共重合体）などのスチレン系熱可塑性エラストマー（スチレン系ブロックコポリマー；例えばスチレン含有量5重量%以上のスチレン系ブロックコポリマー）；ポリウレタン系熱可塑性エラストマー；ポリエステル系熱可塑性エラストマー；ポリプロピレンとEPT（三元系エチレン-プロピレンゴム）とのポリマーブレンドなどのブレンド系熱可塑性エラストマーなどが挙げられる。

【0019】粘着付与樹脂としては、例えば、石油樹脂（脂肪族石油樹脂、芳香族石油樹脂、前記芳香族石油樹脂を水添した脂環族石油樹脂など）、ロジン系樹脂、テルペン系樹脂、スチレン系樹脂、クマロン・インデン系樹脂などが挙げられる。これらの粘着付与樹脂は単独で又は2種以上組み合わせて使用できる。なお、接着剤層2を押しラミネートにより形成する場合には高温で溶融化されるので、酸化に対する安定性の点から、脂環族石油樹脂が特に好ましい。

【0020】接着剤層2に粘着付与樹脂を含有させることにより、テーピング作業性が向上するとともに、キャリアテープなどの包装基材に対して安定かつ良好な接着力が得られる。

【0021】粘着付与樹脂の配合量は、ベースポリマー100重量部に対して、例えば2～50重量部、好ましくは5～30重量部程度である。粘着付与樹脂の配合量が2重量部未満の場合には、例えば支持基材1として紙を用いた際、溶融した接着剤組成物が該紙基材1と接着せず（投錨性が得られず）、単なる押しラミネートではなく、共押し或いはタンデム押しラミネートなどにより中間層を設ける必要が生じる。また、キャリアテープ（紙キャリア）との接着性が得られにくくなる。

【0022】一方、粘着付与樹脂の配合量が、ベースポリマー100重量部に対して50重量部を超えると、押し直後に接着剤層2とこの接着剤層2に接するロールとの間にブロッキングが発生し安定生産ができなくなる恐れがある。また、チップなどの被包装物が接着剤層2

に付着して、回路基板作製工程においてエアノズル吸着不良が発生しやすくなる。さらに、本積層テープをトップカバーテープとして使用する場合には、接着力の著しい上昇のため、10~70gf (98.1~687mN) の適正接着力を超えてしまい、剥離時における易剥離性が損なわれやすくなる。

【0023】高分子型帯電防止剤としては、帯電防止性を有するポリマーであれば特に限定されないが、その代表的な例として、例えば、ポリエーテルエステルアミドなどのポリアミド系コポリマー、カリウムアイオノマーなどのカルボン酸塩基含有ポリマー、第4級アンモニウム塩基含有コポリマー等が挙げられる。高分子型帯電防止剤は、例えばテーピングの際の熱による変質等を防止するため、熱分解温度が120℃以上であるのが好ましい。

【0024】高分子型帯電防止剤の配合量は、ベースポリマー100重量部に対して、例えば1~150重量部、好ましくは20~120重量部程度である。高分子型帯電防止剤を接着剤層2に添加することにより、長期に亘って高い帯電防止性が得られる。例えば、接着剤層2の表面抵抗率を、 $10^{13}\Omega/\square$ 以下 (例えば、 $10^8\sim 10^{13}\Omega/\square$ 程度)、好ましくは $10^9\sim 10^{12}\Omega/\square$ 程度とすることができる。

【0025】高分子型帯電防止剤の配合量が少ない場合、表面抵抗率が $10^{13}\Omega/\square$ を超え、静電気による接着剤層2へのチップ付着が懸念される。

【0026】充填剤としては、無機粉末を使用でき、その代表的な例として、例えば、炭酸カルシウム、炭酸マグネシウムなどの炭酸塩；シリカ微粉末、酸化亜鉛、酸化スズなどの酸化物；水酸化アルミニウムなどの水酸化物；その他、硫酸塩、ケイ酸塩、ホウ酸塩、チタン酸塩等が挙げられる。充填剤の配合量としては、接着剤層2の硬さに寄与させるため、ベースポリマー100重量部に対して、例えば5~100重量部、好ましくは10~80重量部程度である。

【0027】接着剤層2に充填剤を添加して硬くする理由は以下の通りである。すなわち、本発明では、接着剤層2に粘着付与樹脂を配合するため、そのままでは、例えばテーピング時に接着剤層2自体が過剰な軟化状態となり、アイロンなどで圧着された際に接着剤層2を構成する樹脂(糊)がはみ出したり、支持基材1に紙を用いてボトムカバーテープとして使用する場合には、紙裏面から前記樹脂がしみ出す裏抜け現象が生じる。そして、アイロン等に糊が付着して連続テーピング作業ができなくなったり(テーピング機械の停止)、チップ等の挿入及び取出しの際(ハンドリング時)のエアーノズルでの押付けによりチップ等が接着剤層2に付着したり、保管環境(温度、湿度)に起因してチップ等が接着剤層2に付着するなどの不具合が生じる。これに対し、接着剤層2に充填剤を配合すると、接着剤層2の接着性が適度に

抑制され、上記の不具合が解消される。

【0028】充填剤の配合量が、ベースポリマー100重量部に対して100重量部を超えると、接着剤層2と支持基材層1との密着性が低下し、外観不良(ピンホール、分散不良)や接着力低下などのデメリットが生じやすくなる。また、充填剤の配合量が多すぎると、それによって表面抵抗率がより改善されるということもなく、特に吸湿性のある材料を用いた場合には、吸着された水分により押出し時に発泡してピンホールが発生するなど加工性が低下しやすくなり、さらにコストの面からも不利になりやすい。

【0029】本発明の積層テープを例えばトップカバーテープとして使用する場合には、チップ取出し時にトップカバーテープを剥離しなければならず、このときの接着力はバラツキが少なく10~70gf (98.1~687mN) という適正範囲にあることが要求される。また、剥離した際にキャリアテープ(紙キャリア)の毛羽立ちが少ないことが望まれている。このような特性は、接着剤層2に、上記ベースポリマー、粘着付与樹脂、高分子型帯電防止剤、充填剤以外に、界面活性剤を適宜の量配合することで充足させることができる。該界面活性剤の配合量は、例えば、ベースポリマー100重量部に対して、0~10重量部程度である。

【0030】また、前記接着剤層2には、必要に応じて、酸化防止剤、軟化剤、紫外線吸収剤、防錆剤、カップリング剤、前記以外の帯電防止剤、架橋剤などの添加剤を添加してもよい。接着剤層2の厚みは、接着性やハンドリング性などが損なわれない範囲で適宜選択できるが、一般には5~50 μ m程度である。

【0031】本発明では、前記支持基材層1と接着剤層2との間に、両層の密着性を高めるため、中間層を設けることもできる。この中間層は、例えば、ポリオレフィン系樹脂などの熱可塑性樹脂、熱可塑性エラストマー、ゴムなどで構成できる。これらの成分は単独で又は2種以上混合して使用できる。

【0032】ポリオレフィン系樹脂、熱可塑性エラストマーとしては、前記例示のものを使用できる。ゴムとしては、例えば、NR(天然ゴム)；IR(イソプレンゴム)、SBR(スチレン-ブタジエンゴム)、BR(ブタジエンゴム)、CR(クロロプレンゴム)、NBR(ニトリルゴム)、EPR(二元系エチレン-プロピレンゴム)、EPT(三元系エチレン-プロピレンゴム)、IIR(ブチルゴム)、アクリルゴム、ウレタンゴム、酸変性エラストマー(カルボキシル基変性エラストマー等)、エポキシ基変性エラストマーなどの合成ゴムが挙げられる。

【0033】中間層の厚みは、積層テープとしたときの取扱性等を損なわない範囲で適宜選択できるが、一般には5~30 μ m程度である。

【0034】本発明の積層テープは、例えば、接着剤層

2の構成成分を所定の配合割合に2軸混練機でメルトブレンドしペレット化したもの、又はドライブレンドしたものを慣用のシングル又はタンデム押しラミネート法により、支持基材層1上に、中間層を介し又は介さずにラミネートすることにより製造できる。また、接着剤層2と中間層とを支持基材層1上に共押しラミネートにより積層して製造することもできる。

【0035】こうして得られる積層テープは、チップ固定抵抗器などの抵抗器、積層セラミックコンデンサなどのチップ型電子部品を搬送する際の包装材（例えば、トップカバーテープ、ボトムカバーテープなど）等として好適に使用できる。

【0036】

【発明の効果】本発明の包装材用積層テープは、接着剤層が特定の成分により構成されているので、キャリアテープ等の包装基材に対する熱接着性に優れると共に、湿度の高低によらず高い帯電防止性を長期に亘って保持でき、しかも高温（～60℃）においてもチップ等の被包装物の付着を抑制できる。また、トップカバーテープとして使用する場合には、一旦熱接着したキャリアテープ等の包装基材からの剥離も容易である。従って、例えば、輸送時あるいは剥離時の帯電によるチップ等の付着やチップ等の飛び出し、エアノズルでのチップ押えによる付着などの不具合が解消され、基板への円滑なチップ供給が可能となる。

【0037】

【実施例】以下、本発明を実施例に基づいてより詳細に説明するが、本発明はこれらの実施例により何ら限定されるものではない。

【0038】実施例1

低密度ポリエチレン（LDPE）（ベースポリマー、商品名「ミラソン16P」、三井化学（株）製）100重量部、脂環族系石油樹脂（粘着付与樹脂、商品名「アルコンP-125」、荒川化学工業（株）製）15重量部、炭酸カルシウム（充填剤、商品名「スーパーS」、丸尾カルシウム（株）製）50重量部、及びポリエーテルエステルアミド（高分子型帯電防止剤、商品名「ベレスタット2450」、三洋化成工業（株）製）75重量部を2軸混練機にてメルトブレンドした熔融組成物を、和紙（支持基材、厚み30μm）上に、シングル押しラミネーターにて、厚みが30μmとなるように押し出し、積層テープを得た。

【0039】実施例2

低密度ポリエチレン（LDPE）（ベースポリマー、商品名「ミラソン16P」、三井化学（株）製）100重量部、脂環族系石油樹脂（粘着付与樹脂、商品名「アルコンP-125」、荒川化学工業（株）製）8重量部、炭酸カルシウム（充填剤、商品名「スーパーS」、丸尾カルシウム（株）製）17重量部、及びカリウムアイオノマー（高分子型帯電防止剤、商品名「SD100」、

三井デュボンポリケミカル（株）製）42重量部を2軸混練機にてメルトブレンドした熔融組成物を、和紙（支持基材、厚み30μm）上に、シングル押しラミネーターにて、厚みが30μmとなるように押し出し、積層テープを得た。

【0040】比較例1

低密度ポリエチレン（LDPE）（商品名「ミラソン10P」、三井化学（株）製）を、和紙（支持基材、厚み30μm）上に、シングル押しラミネーターにて、厚みが30μmとなるように押し出し、積層テープを得た。

【0041】比較例2

低密度ポリエチレン（LDPE）（商品名「ミラソン10P」、三井化学（株）製）を、和紙（支持基材、厚み30μm）上に、シングル押しラミネーターにて、厚みが30μmとなるように押し出して接着剤層を形成した後、この接着剤層表面をコロナ放電処理し、さらにキスロールコーターにてカチオン系帯電防止剤（商品名「SAT-4」、日本純薬（株）製）を塗布、乾燥し積層テープを得た。

【0042】評価試験

実施例及び比較例で得られた各積層テープにつき、以下の試験を行った。その結果を表1に示す。

（接着力）紙キャリア（北越製紙（株）製、HOCTO-60）の表面に、各積層テープを熱シール機（東京ウェルズ（株）製のテーピングマシン）を用いて、170℃、アイロン押さえ力1.5kgf（14.7N）、1200PCS/minの条件で熱シールした後、剥離試験機を用いて、剥離速度300mm/分、剥離角度約180°の条件で接着力を測定した。

【0043】（表面抵抗率1）各積層テープの表面抵抗率を、高抵抗率計ハイレスタUP（三菱化学（株）製）を用い、23℃/65%RHの雰囲気下、500V×30秒の条件で測定した。

（表面抵抗率2）各積層テープの表面抵抗率を、高抵抗率計ハイレスタUP（三菱化学（株）製）を用い、23℃/30%RHの雰囲気下、500V×30秒の条件で測定した。

【0044】（半減期）JIS L 1094に準拠して、各積層テープの接着剤層側の半減期をスタチックオネストメーターにて測定した。なお、半減期とは、テープ表面を帯電させ、その電圧が初期電圧の半分の値に達するまでの時間を意味する。

（摩擦帯電圧）JIS L 1094に準拠して、各積層テープの接着剤層側の摩擦帯電圧を測定した。

【0045】（チップ付着率）各積層テープの接着剤層とチップとを接触させ、60℃で10分加温後、チップの付着した割合を求めた。なお、1試験片につき50個のチップを用いて試験を行った。

（実装率1）各積層テープによりテーピングされたチッ

ブ(1005タイプ) [500PCS/1試験片] を室温放置後に実装機にかけたときのエアノズルで吸着できた割合を求めた。

(実装率2) 各積層テープによりテーピングされたチップ(1005タイプ) [500PCS/1試験片] を、

40℃/92%RHの条件で5日間放置後に実装機にかけたときのエアノズルで吸着できた割合を求めた。

【0046】

【表1】

表 1

		実施例 1	実施例 2	比較例 1	比較例 2
テープ特性	総厚さ (μm)	58	60	55	56
	接着力 (N/5.25mm幅)	1.57	1.67	1.96	1.08
	表面抵抗率 1 (Ω/□)	3×10^{10}	6×10^{10}	$>1 \times 10^{14}$	6×10^9
	表面抵抗率 2 (Ω/□)	5×10^{11}	8×10^{11}	$>1 \times 10^{14}$	7×10^{12}
	半減期(秒)	1	1	1200以上	1以下
	摩擦帯電圧 (V)	12	22	2000	30
	チップ付着率 (%)	0	0	15	20
実装率 1 (%)		100.0	100.0	99.8	100.0
実装率 2 (%)		100.0	100.0	99.6	99.6

【図面の簡単な説明】

【図1】 本発明の包装材料用積層テープの一例を示す概略断面図である。

【符号の説明】

- 1 支持基材層
- 2 接着剤層

【図1】



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(72)Inventor : NAKANO ICHIRO
ICHIKAWA HIROKI

(54) LAMINATED TAPE FOR PACKAGING MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To provide laminated tapes for packaging materials which excel in thermal adhesion to packaging base material such as carrier tapes and, simultaneously, exhibit high antistatic properties independently of high and low humidity or even after long-term storage.

SOLUTION: The laminated tapes for packaging materials have an adhesive layer containing a base polymer, a tackifying resin layer, a polymeric antistatic agent, and a filler which has been laminated on a support base material. The adhesive layer may contain, based on 100 pts.wt. base polymer, 2-50 pts.wt. tackifying resin, 1-150 pts.wt. polymeric anti-static agent, and 5-100 pts.wt. filler. The adhesive layer has a thickness of, e.g. about 5-50 μm , and a surface resistivity of, e.g. $\leq 10^{13} \Omega/(\text{square})$.



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CLAIMS

[Claim(s)]

[Claim 1] The laminating tape for packing materials on which the laminating of the adhesives layer containing a base polymer, a tackifier, a macromolecule mold antistatic agent, and a bulking agent is carried out on the support base material layer.

[Claim 2] An adhesives layer is [tackifier] the laminating tape for packing materials of 5 – 100 weight ***** claim 1 publication about the 1 – 150 weight section and a bulking agent in 2 – 50 weight section and a macromolecule mold antistatic agent to the base polymer 100 weight section.

[Claim 3] The laminating tape for packing materials according to claim 1 or 2 whose surface resistivity of an adhesives layer the thickness of an adhesives layer is 5–50 micrometers, and is below 10¹³ohms / **.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the laminating tape used as an object for packing materials which packs these electronic parts etc. at the time of conveyance of chip mold electronic parts etc.

[0002]

[Description of the Prior Art] The taping reel method which packs and conveys these electronic parts on the laminating tape for packing materials as a method which conveys chip mold electronic parts, such as a chip fixed resistor and a stacked type ceramic condenser, is learned. By this taping reel method, carry out the heat seal (taping) of the underside of the paper carrier (carrier tape) which formed the blanking angle hole for chip mold electronic parts receipt in the die-length direction of tape-like cardboard at fixed spacing on a bottom product covering tape, and the pocket for receipt is produced. After inserting chip mold electronic parts in said pocket for receipt, carrying out the heat seal of the top face of said paper carrier on a top covering tape and enclosing chip mold electronic parts immediately after that, it is rolled round in the shape of a reel, and is conveyed. And in production processes, such as the circuit board of a conveyance place, the automatic ***** system which adsorbs the contained chip mold electronic parts automatically by the air jet hole after exfoliating a top covering tape, and is supplied on a substrate is in use.

[0003] the covering tape (a top covering tape and bottom product covering tape) used as a packing material of electronic parts in a series of processes to the chip supply to a substrate from such taping — receiving — in order to supply a chip certainly, the following engine performance is demanded. namely, suppress generating of static electricity by the oscillation in the middle of the time of having a good adhesive property to (i) paper carrier, and (ii) taping activity, and transport, or It excels in the so-called antistatic nature which controls the elutriation from the pocket of the chip by exfoliation electrification at the time of exfoliating a top covering tape, (iii) It is not adhering to the adhesives layer of a bottom product covering tape, even if a chip's is pressed down by an air jet hole etc. at the time of originating in the environmental conditions in the middle of transport (temperature, humidity, etc.), and a chip's not adhering to the adhesives layer of a covering tape, (iv) chip insertion, and chip ejection etc.

[0004] Especially, small and light-ization progresses in chip mold electronic parts, and since the prime size is shifting to a very small and light chip, it asks for the covering tape superior to that of the above-mentioned engine performance in recent years.

[0005] Conventionally, that by which the laminating of the adhesives layer which scoured the surfactant was carried out to polyolefine system resin on the support base material through the interlayer as a top covering tape is known. This covering tape has the outstanding adhesive property and easy-releasability, and since it is satisfactory practically also in antistatic nature, it is used widely. Moreover, that by which the antistatic coating agent was applied to the front face of an adhesives layer prepared on the base material as a bottom product covering tape is used. However, engine performance, such as antistatic nature, falls with time, and these covering tapes have the problem of being scarce at preservation stability. In addition, although there is also a

case where a polymer type antistatic coating agent is used, partly, it has the fault of being easy to adhere with a chip with heat (elevated-temperature storage).

[0006] therefore, when such a covering tape is used A process until it results in supply of the chip from insertion of the chip to the punching angle hole for chip receipt prepared in the paper carrier to the heat seal of a top covering tape, conveyance, and a substrate A chip can adhere to a bottom product covering tape with static electricity, and cannot take out, or In the case of exfoliation of a top covering tape, a chip jumps out by exfoliation electrification of this tape, or The various nonconformities that slight adhesion arises between a chip and an adhesives layer according to a temperature environment etc., or a chip was pushed by the air jet hole and adhered to a bottom product covering tape were promoted, and there was a problem that smooth chip supply was checked.

[0007]

[Problem(s) to be Solved by the Invention] Therefore, the object of this invention is to offer the laminating tape for packing materials which shows high antistatic nature even if it is not based on the height of humidity but saves for a long period of time again, and can control adhesion of packaging goods-ed, such as a chip, while it is excellent in the heat adhesive property over package base materials, such as a carrier tape. In addition to the above-mentioned property, other objects of this invention are to offer further the laminating tape for packing materials which can exfoliate easily from package base materials, such as said carrier tape.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned object, as a result of inquiring wholeheartedly, when this invention persons constituted the adhesives layer prepared on a support base material layer from a specific component, they completed a header and this invention for the ability of both the adhesive property and antistatic nature (the preservation stability and humidity dependency) to a package base material, and the adhesion tightness of packaging goods-ed to be satisfied. That is, this invention offers the laminating tape for packing materials on which the laminating of the adhesives layer containing a base polymer, a tackifier, a macromolecule mold antistatic agent, and a bulking agent is carried out on the support base material layer.

[0009]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained, referring to a drawing if needed. Drawing 1 is the outline sectional view showing an example of the laminating tape for packing materials of this invention.

[0010] This laminating tape for packing materials consists of a support base material layer 1 and an adhesives layer 2 prepared on this support base material layer 1. That what is necessary is just what has self-support nature as a support base material which constitutes the support base material layer 1 For example, papers, such as Japanese paper, tissue paper, crepe paper, a synthetic paper, mixed papermaking, and compound paper; A nonwoven fabric, Cloth; Olefin system resin, such as polyethylene, polypropylene, and ethylene-acid copolymerization resin, Thermoplastic elastomer, such as polypropylene modified resin and a styrene thermoplastic elastomer, The plastic film or sheet which consisted of thermoplastics, such as polyester, such as polyethylene terephthalate, polybutylene terephthalate, and polyethylenenaphthalate; Copper, The metallic foil or sheet metal which consisted of metals, such as aluminum; these layered products etc. are mentioned.

[0011] As for said support base material, it is desirable that the melting point is 90 degrees C or more. When the melting point is less than 90 degrees C, in case it tapes by thermocompression bonding for example, using a metal iron etc., a support base material fuses, it adheres to an iron etc., and there is a possibility that it may become impossible to attain the object of an original package.

[0012] As for the front face (it is the field of an opposite hand in the adhesives layer 2) of the support base material layer 1, surface treatment of common use, easy-sliding processing, antistatic treatment, etc. may be performed. Moreover, among the support base material layers 1, processing for improving anchoring nature, such as ozonization and corona treatment, may be

skillful stage by anchor coat agent application may be taken by the field by the side of the adhesives layer 2.

[0013] Although the thickness of the support base material layer 1 can be chosen in the large range according to an application in the range in which a mechanical strength, handling nature, etc. are not spoiled, generally it is about 10–50 micrometers preferably about 5–100 micrometers.

[0014] The adhesives layer 2 consists of thermoplastic adhesives with which the base polymer, the tackifier, the macromolecule mold antistatic agent, and the bulking agent were distributed by homogeneity.

[0015] As a base polymer, thermoplastics, such as olefin system resin and vinyl acetate system resin, thermoplastic elastomer, etc. can be used, for example. These polymers are independent, or they can be used, combining them two or more sorts.

[0016] as said olefin system resin — polyethylene (low density polyethylene —) a line — low density polyethylene, metallocene catalyst method polyethylene, high density polyethylene, etc. Polyolefines, such as polypropylene and ethylene- α olefin copolymerization resin; An ethylene copolymer for example, ethylene-unsaturated-carboxylic-acid copolymer; ionomer; ethylene-methyl-acrylate copolymers, such as an ethylene-acrylic-acid copolymer (EAA) and an ethylene-methacrylic-acid copolymer (EMAA), — An ethylene-ethyl-acrylate copolymer (EEA), ethylene-(meta) acrylic ester copolymers [, such as an ethylene-methyl-methacrylate copolymer,]; — ethylene-vinylacetate copolymer (EVA); —; polypropylene modified resin, such as an ethylene-vinylalcohol copolymer, etc. is mentioned.

[0017] As vinyl acetate system resin, a polyvinyl acetate and vinyl acetate-(meta) acrylic ester copolymer, a vinyl acetate-vinyl ester copolymer, a vinyl acetate-maleate copolymer, etc. are mentioned, for example.

[0018] As thermoplastic elastomer, for example SIS (styrene-isoprene-styrene block copolymer), SBS (styrene-butadiene-styrene block copolymer), SEBS (styrene-ethylene-butylene-styrene block copolymer), SEPS (styrene-ethylene-propylene-styrene block copolymer), SEP (Styrene-ethylene-propylene block copolymer) etc. — styrene thermoplastic elastomer (styrene system block-copolymer; for example, styrene system block copolymer of 5 % of the weight or more of styrene contents); — polyurethane system thermoplastic-elastomer; — Thermoplastic elastomer polyester; blend system thermoplastic elastomer, such as a polymer blend of polypropylene and EPT (ternary system ethylene-propylene rubber), etc. is mentioned.

[0019] As a tackifier, petroleum resin (aliphatic series petroleum resin, aromatic series petroleum resin, alicycle group petroleum resin that carried out hydrogenation of said aromatic series petroleum resin), rosin system resin, terpene system resin, styrene resin, cumarone indene system resin, etc. are mentioned, for example. These tackifiers are independent, or they can be used, combining them two or more sorts. In addition, since it is melting-ized at an elevated temperature when extruding the adhesives layer 2 and forming by lamination, the point of stability over oxidation to especially alicycle group petroleum resin is desirable.

[0020] While taping workability improves by making the adhesives layer 2 contain a tackifier, stability and good adhesive strength are obtained to package base materials, such as a carrier tape.

[0021] the loadings of a tackifier — the base polymer 100 weight section — receiving — for example, 2 – 50 weight section — it is 5 – 30 weight section extent preferably. When the loadings of a tackifier are under 2 weight sections and paper is used as a support base material 1, the fused adhesives constituent will not need to paste up with this paper base 1 (anchoring nature is not obtained), but will need to prepare an interlayer by not a mere extrusion lamination but the co-extrusion, or tandem extrusion lamination. Moreover, an adhesive property with a carrier tape (paper carrier) becomes is hard to be acquired.

[0022] On the other hand, when the loadings of a tackifier exceed 50 weight sections to the base polymer 100 weight section, there is a possibility that blocking may occur and stable production may become impossible between the rolls which touch the adhesives layer 2 and this adhesives layer 2 immediately after extrusion. Moreover, packaging goods-ed, such as a chip, adhere to the

production process. Furthermore, in using this laminating tape as a top covering tape, for remarkable lifting of adhesive strength, the proper adhesive strength of 10–70gf (98.1–687mN) is exceeded, and the easy-releasability at the time of exfoliation becomes is easy to be spoiled.

[0023] Although it will not be limited especially if it is the polymer which has antistatic nature as a macromolecule mold antistatic agent, carboxylate radical content polymers, such as polyamide system copolymers, such as for example, a polyether ester amide, and a potassium ionomer, a quarternary-ammonium-salt radical content copolymer, etc. are mentioned as the typical example. As for a macromolecule mold antistatic agent, it is desirable that pyrolysis temperature is 120 degrees C or more in order to prevent deterioration by the heat in the case of taping etc.

[0024] the loadings of a giant-molecule mold antistatic agent — the base polymer 100 weight section — receiving — for example, the 1 – 150 weight section — it is 20 – 120 weight section extent preferably. By adding a macromolecule mold antistatic agent in the adhesives layer 2, it continues at a long period of time, and high antistatic nature is obtained. For example, the surface resistivity of the adhesives layer 2 can be preferably made into 109–1012ohms / ** extent below 1013ohms / ** (for example, 108–1013ohms / ** extent).

[0025] When there are few loadings of a macromolecule mold antistatic agent, surface resistivity exceeds 1013ohms / **, and we are anxious about chip adhesion in the adhesives layer 2 by static electricity.

[0026] as a bulking agent — inorganic powder — it can be used — as the typical example — for example, hydroxides [, such as an oxide; aluminum hydroxide,],, such as carbonate; silica impalpable powder, such as a calcium carbonate and a magnesium carbonate, a zinc oxide, and tin oxide, — in addition to this, a sulfate, a silicate, a borate, a titanate, etc. are mentioned. in order to make it contribute to the hardness of the adhesives layer 2 as loadings of a bulking agent — the base polymer 100 weight section — receiving — for example, the 5 – 100 weight section — it is 10 – 80 weight section extent preferably.

[0027] The reason which adds a bulking agent in the adhesives layer 2, and is hardened is as follows. That is, in the resin (paste) which constitutes the adhesives layer 2 from this invention when adhesives layer 2 the very thing changes into a superfluous softening condition and is stuck by pressure with an iron etc., for example at the time of taping, if it remains as it is in order to blend a tackifier with the adhesives layer 2 overflowing, or using paper for the support base material 1 and using it as a bottom product covering tape, the strike-through phenomenon in which said resin oozes out arises from a paper rear face. And a paste adheres to an iron etc., a continuation taping activity becomes impossible, or a chip etc. adheres to the adhesives layer 2 by insertion of (a halt of a taping machine), a chip, etc., and forcing by the air jet hole in the case of drawing (at the time of handling), or it originates in storage environment (temperature, humidity), and the nonconformity of a chip etc. adhering to the adhesives layer 2 arises. On the other hand, if a bulking agent is blended with the adhesives layer 2, the adhesive property of the adhesives layer 2 will be controlled moderately, and the above-mentioned nonconformity will be canceled.

[0028] If the loadings of a bulking agent exceed the 100 weight sections to the base polymer 100 weight section, the adhesion of the adhesives layer 2 and the support base material layer 1 will fall, and it will become easy to produce demerits, such as a poor appearance (a pinhole, maldistribution) and adhesive strength lowering. Moreover, if there are too many loadings of a bulking agent, it will extrude by it with the moisture adsorbed when the ingredient which surface resistivity is not necessarily improved more and has especially hygroscopicity was used, and will sometimes foam, and it becomes easy for workability — a pinhole occurs — to fall, and is easy to become still more disadvantageous also from the field of cost.

[0029] When using the laminating tape of this invention as for example, a top covering tape, a top covering tape must be exfoliated at the time of chip drawing, and it is required that the adhesive strength at this time should have variation in proper range called 10–70gf (98.1–687mN) few. Moreover, when it exfoliates, little fuzz of a carrier tape (paper carrier) is wanted for there to be. Such a property can be satisfied with the above-mentioned base polymer, a tackifier, and a macromolecule mold antistatic agent in the adhesives layer 2, and can make a surfactant satisfy

this surface active agent are 0 - 10 weight section extent for example, to the base polymer 100 weight section.

[0030] Moreover, in said adhesives layer 2, additives, such as an antioxidant, a softener, an ultraviolet ray absorbent, a rust-proofer, a coupling agent, an antistatic agent except said, and a cross linking agent, may be added if needed. Although the thickness of the adhesives layer 2 can be suitably chosen in the range in which neither an adhesive property nor handling nature is spoiled, generally it is about 5-50 micrometers.

[0031] In this invention, since the adhesion of both layers is raised between said support base material layers 1 and adhesives layers 2, an interlayer can also be prepared in it. This interlayer can consist of thermoplastics, such as for example, polyolefine system resin, thermoplastic elastomer, rubber, etc. These components are independent, or two or more sorts can use them, mixing.

[0032] The thing of said instantiation can be used as polyolefine system resin and thermoplastic elastomer. As rubber, synthetic rubber, such as NR(natural rubber);IR (polyisoprene rubber), SBR (styrene butadiene rubber), BR (butadiene rubber), CR (chloroprene rubber), NBR (nitrile rubber), EPR (dual system ethylene-propylene rubber), EPT (ternary system ethylene-propylene rubber) and IIR (isobutylene isoprene rubber), acrylic rubber, polyurethane rubber, acid denaturation elastomers (carboxyl group denaturation elastomer etc.), and an epoxy group denaturation elastomer, is mentioned, for example.

[0033] Although an interlayer's thickness can be suitably chosen in the range which does not spoil the handling nature when considering as a laminating tape etc., generally it is about 5-30 micrometers.

[0034] The laminating tape of this invention can be manufactured by laminating without minding through an interlayer on the support base material layer 1 by the single of common use of the thing which carried out the melt blend and pelletized the constituent of the adhesives layer 2 with the biaxial kneading machine to the predetermined blending ratio of coal, or the thing which carried out dryblend, or the tandem extrusion laminating method. Moreover, on the support base material layer 1, the laminating of the adhesives layer 2 and the interlayer can be carried out by co-extrusion lamination, and they can also be manufactured.

[0035] In this way, the laminating tape obtained can be suitably used as packing materials at the time of conveying chip mold electronic parts, such as resistors, such as a chip fixed resistor, and a stacked type ceramic condenser, (for example, a top covering tape, a bottom product covering tape, etc.) etc.

[0036]

[Effect of the Invention] The laminating tape for packing materials of this invention cannot be based on the height of humidity, but can continue and hold high antistatic nature at a long period of time, and, moreover, can control adhesion of packaging goods—ed, such as a chip, also in an elevated temperature (- 60 degrees C) while it is excellent in the heat adhesive property over package base materials, such as a carrier tape, since the adhesives layer is constituted by the specific component. Moreover, when using it as a top covering tape, the exfoliation from package base materials, such as a carrier tape which once carried out heat adhesion, is also easy. It follows, for example, nonconformities, such as adhesion by the chip presser foot by elutriation, such as adhesion of the chip by electrification at the time of transport or exfoliation etc. and a chip, and the air jet hole, are canceled, and the smooth chip supply to a substrate is attained.

[0037]

[Example] Hereafter, although this invention is explained more to a detail based on an example, this invention is not limited at all by these examples.

[0038] example 1 low density polyethylene (LDPE) (a base polymer and a trade name "Myra Son 16P" —) the 100 weight sections by Mitsui Chemicals, Inc., and alicycle group system petroleum resin (a tackifier —) 15 weight sections made from trade name "Al Cong P-125" Arakawa Chemical industry, The calcium-carbonate (bulking agent, trade name "super S", Maruo Calcium Co., Ltd. make) 50 weight section, and a polyether ester amide (a macromolecule mold antistatic agent and a trade name "PERESUTATTO 2450" —) On Japanese paper (a support base

of the 75 weight sections by Sanyo Chemical Industries, Ltd. with the biaxial kneading machine was extruded so that thickness might be set to 30 micrometers with a single extrusion laminator, and the laminating tape was obtained.

[0039] example 2 low density polyethylene (LDPE) (a base polymer and a trade name "Myra Son 16P" —) the 100 weight sections by Mitsui Chemicals, Inc., and alicycle group system petroleum resin (a tackifier —) Eight weight sections made from trade name "Al Cong P-125" Arakawa Chemical industry, The calcium-carbonate (bulking agent, trade name "super S", Maruo Calcium Co., Ltd. make) 17 weight section, and a potassium ionomer (a macromolecule mold antistatic agent and a trade name "SD100" —) On Japanese paper (a support base material, thickness of 30 micrometers), the melting constituent which carried out the melt blend of the Mitsui DEYUPON poly chemical 42 Weight section with the biaxial kneading machine was extruded so that thickness might be set to 30 micrometers with a single extrusion laminator, and the laminating tape was obtained.

[0040] On Japanese paper (a support base material, thickness of 30 micrometers), example of comparison 1 low density polyethylene (LDPE) (a trade name "Myra Son 10P", Mitsui Chemicals, Inc. make) was extruded so that thickness might be set to 30 micrometers with a single extrusion laminator, and the laminating tape was obtained.

[0041] After having extruded example of comparison 2 low density polyethylene (LDPE) (a trade name "Myra Son 10P", Mitsui Chemicals, Inc. make) on Japanese paper (a support base material, thickness of 30 micrometers) so that thickness might be set to 30 micrometers with a single extrusion laminator, and forming an adhesives layer, corona discharge treatment of this adhesives layer front face was carried out, and further, the cation system antistatic agent (a trade name "SAT-4", Nippon Junyaku make) was applied, it dried in the kiss roll coating machine, and the laminating tape was obtained.

[0042] The following trials were performed about each laminating tape obtained in the assessment trial example and the example of a comparison. The result is shown in a table 1. (Adhesive strength) After using the heat seal machine (taping machine by Tokyo Wells) and carrying out the heat seal of each laminating tape to the front face of a paper carrier (the Hokuetsu Paper Mills, Ltd. make, HOCTO-60) on condition that 170 degrees C, iron presser-foot force 1.5kgf (14.7Ns), and 1200 PCS/min, adhesive strength was measured using the friction test machine on a part for 300mm/in exfoliation rate, and conditions with an exfoliation include angle of about 180 degrees.

[0043] (Surface resistivity 1) The surface resistivity of each laminating tape was measured on the conditions for 500Vx 30 seconds under the ambient atmosphere of 23 degrees C / 65%RH using high resistivity meter Huy Lester UP (Mitsubishi Chemical make).

(Surface resistivity 2) The surface resistivity of each laminating tape was measured on the conditions for 500Vx 30 seconds under the ambient atmosphere of 23 degrees C / 30%RH using high resistivity meter Huy Lester UP (Mitsubishi Chemical make).

[0044] (Half-life) JIS L Based on 1094, the half-life by the side of the adhesives layer of each laminating tape was measured in static ONESUTO meter. In addition, a half-life electrifies a tape front face and means time amount until the electrical potential difference reaches the value of the one half of initial voltage.

(Friction band electrical potential difference) JIS L Based on 1094, the friction band electrical potential difference by the side of the adhesives layer of each laminating tape was measured.

[0045] (Chip deposit efficiency) the adhesives layer and chip of each laminating tape are contacted — making — 60 degrees C — 10 minutes — warming — it asked for the rate to which the chip adhered the back. In addition, it examined using 50 chips per one test piece.

(Rate 1 of mounting) It asked for the rate which has adsorbed the chip (1005 types) [500PCS/1 test piece] taped on each laminating tape by the air jet hole when applying to a mounting machine after room temperature neglect.

(Rate 2 of mounting) It asked for the rate which has adsorbed the chip (1005 types) [500PCS/1 test piece] taped on each laminating tape by the air jet hole when applying to a mounting machine after neglect for five days on condition that RH 40 degrees C / 92%.

[A table 1]

表 1

		実施例 1	実施例 2	比較例 1	比較例 2
テープ 特性	総厚さ (μm)	58	60	55	56
	接着力 (N/5.25mm幅)	1.57	1.67	1.96	1.08
	表面抵抗率 1 (Ω/□)	3×10^{10}	6×10^{10}	$>1 \times 10^{14}$	6×10^9
	表面抵抗率 2 (Ω/□)	5×10^{11}	8×10^{11}	$>1 \times 10^{14}$	7×10^{12}
	半減期 (秒)	1	1	1200以上	1以下
	摩擦帯電圧 (V)	12	22	2000	30
	チップ付着率 (%)	0	0	15	20
実装率 1 (%)		100.0	100.0	99.8	100.0
実装率 2 (%)		100.0	100.0	99.6	99.6

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the laminating tape used as an object for packing materials which packs these electronic parts etc. at the time of conveyance of chip mold electronic parts etc.

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PRIOR ART

[Description of the Prior Art] The taping reel method which packs and conveys these electronic parts on the laminating tape for packing materials as a method which conveys chip mold electronic parts, such as a chip fixed resistor and a stacked type ceramic condenser, is learned. Carry out the heat seal (taping) of the underside of the paper carrier (carrier tape) which formed the blanking angle hole for chip mold electronic parts receipt in the die-length direction of tape-like cardboard at fixed spacing on a bottom product covering tape by this taping reel method. The pocket for receipt is produced, and after inserting chip mold electronic parts in said pocket for receipt, carrying out the heat seal of the top face of said paper carrier on a top covering tape and enclosing chip mold electronic parts immediately after that, it is rolled round in the shape of a reel, and is conveyed. And in production processes, such as the circuit board of a conveyance place, the automatic ***** system which adsorbs the contained chip mold electronic parts automatically by the air jet hole after exfoliating a top covering tape, and is supplied on a substrate is in use.

[0003] the covering tape (a top covering tape and bottom product covering tape) used as a packing material of electronic parts in a series of processes to the chip supply to a substrate from such taping — receiving — in order to supply a chip certainly, the following engine performance is demanded. namely, suppress generating of static electricity by the oscillation in the middle of the time of having a good adhesive property to (i) paper carrier, and (ii) taping activity, and transport, or It excels in the so-called antistatic nature which controls the elutriation from the pocket of the chip by exfoliation electrification at the time of exfoliating a top covering tape, (iii) Even if a chip is pressed down by an air jet hole etc. at the time of that originate in the environmental conditions in the middle of transport (temperature, humidity, etc.), and a chip does not adhere to the adhesives layer of a covering tape, (iv) chip insertion, and chip ejection It is not adhering to the adhesives layer of a bottom product covering tape etc.

[0004] Especially, small and light-ization progresses in chip mold electronic parts, and since the prime size is shifting to a very small and light chip, it asks for the covering tape superior to that of the above-mentioned engine performance in recent years.

[0005] Conventionally, that by which the laminating of the adhesives layer which scoured the surfactant was carried out to polyolefine system resin on the support base material through the interlayer as a top covering tape is known. This covering tape has the outstanding adhesive property and easy-releasability, and since it is satisfactory practically also in antistatic nature, it is used widely. Moreover, that by which the antistatic coating agent was applied to the front face of an adhesives layer prepared on the base material as a bottom product covering tape is used. However, engine performance, such as antistatic nature, falls with time, and these covering tapes have the problem of being scarce, at preservation stability. In addition, although there is also a case where a polymer type antistatic coating agent is used, partly, it has the fault of being easy to adhere with a chip with heat (elevated-temperature storage).

[0006] Therefore, when such a covering tape is used, it is, A process until it results in supply of the chip from insertion of the chip to the punching angle hole for chip receipt prepared in the paper carrier to the heat seal of a top covering tape, conveyance, and a substrate A chip can adhere to a bottom product covering tape with static electricity and cannot take out or In the

case of exfoliation of a top covering tape, a chip jumps out by exfoliation electrification of this tape, or The various nonconformities that slight adhesion arises between a chip and an adhesives layer according to a temperature environment etc., or a chip was pushed by the air jet hole and adhered to a bottom product covering tape. were promoted, and there was a problem that smooth chip supply was checked.

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EFFECT OF THE INVENTION

[Effect of the Invention] The laminating tape for packing materials of this invention cannot be based on the height of humidity, but can continue and hold high antistatic nature at a long period of time, and, moreover, can control adhesion of packaging goods-ed, such as a chip, also in an elevated temperature (- 60 degrees C) while it is excellent in the heat adhesive property over package base materials, such as a carrier tape, since the adhesives layer is constituted by the specific component. Moreover, when using it as a top covering tape, the exfoliation from package base materials, such as a carrier tape which once carried out heat adhesion, is also easy. It follows, for example, nonconformities, such as adhesion by the chip presser foot by elutriation, such as adhesion of the chip by electrification at the time of transport or exfoliation etc. and a chip, and the air jet hole, are canceled, and the smooth chip supply to a substrate is attained.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Therefore, the object of this invention is to offer the laminating tape for packing materials which shows high antistatic nature even if it is not based on the height of humidity but saves for a long period of time again, and can control adhesion of packaging goods—ed, such as a chip, while it is excellent in the heat adhesive property over package base materials, such as a carrier tape. In addition to the above-mentioned property, other objects of this invention are to offer further the laminating tape for packing materials which can exfoliate easily from package base materials, such as said carrier tape.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, as a result of inquiring wholeheartedly, when this invention persons constituted the adhesives layer prepared on a support base material layer from a specific component, they completed a header and this invention for the ability of both the adhesive property and antistatic nature (the preservation stability and humidity dependency) to a package base material, and the adhesion tightness of packaging goods-ed to be satisfied. That is, this invention offers the laminating tape for packing materials on which the laminating of the adhesives layer containing a base polymer, a tackifier, a macromolecule mold antistatic agent, and a bulking agent is carried out on the support base material layer.

[0009]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained, referring to a drawing if needed. Drawing 1 is the outline sectional view showing an example of the laminating tape for packing materials of this invention.

[0010] This laminating tape for packing materials consists of a support base material layer 1 and an adhesives layer 2 prepared on this support base material layer 1. That what is necessary is just what has self-support nature as a support base material which constitutes the support base material layer 1 For example, papers, such as Japanese paper, tissue paper, crepe paper, a synthetic paper, mixed papermaking, and compound paper; A nonwoven fabric, Cloth; Olefin system resin, such as polyethylene, polypropylene, and ethylene-acid copolymerization resin, Thermoplastic elastomer, such as polypropylene modified resin and a styrene thermoplastic elastomer, The plastic film or sheet which consisted of thermoplastics, such as polyester, such as polyethylene terephthalate, polybutylene terephthalate, and polyethylenenaphthalate; Copper, The metallic foil or sheet metal which consisted of metals, such as aluminum; these layered products etc. are mentioned.

[0011] As for said support base material, it is desirable that the melting point is 90 degrees C or more. When the melting point is less than 90 degrees C, in case it tapes by thermocompression bonding for example, using a metal iron etc., a support base material fuses, it adheres to an iron etc., and there is a possibility that it may become impossible to attain the object of an original package.

[0012] As for the front face (it is the field of an opposite hand in the adhesives layer 2) of the support base material layer 1, surface treatment of common use, easy-sliding processing, antistatic treatment, etc. may be performed. Moreover, among the support base material layers 1, processing for improving anchoring nature, such as ozonization and corona treatment, may be performed, and when especially a support base material is a plastic film, the anchoring disposition skillful stage by anchor coat agent application may be taken by the field by the side of the adhesives layer 2.

[0013] Although the thickness of the support base material layer 1 can be chosen in the large range according to an application in the range in which a mechanical strength, handling nature, etc. are not spoiled, generally it is about 10-50 micrometers preferably about 5-100 micrometers.

[0014] The adhesives layer 2 consists of thermoplastic adhesives with which the base polymer

the tackifier, the macromolecule mold antistatic agent, and the bulking agent were distributed by homogeneity.

[0015] As a base polymer, thermoplastics, such as olefin system resin and vinyl acetate system resin, thermoplastic elastomer, etc. can be used, for example. These polymers are independent, or they can be used, combining them two or more sorts.

[0016] as said olefin system resin — polyethylene (low density polyethylene —) a line — low density polyethylene, metallocene catalyst method polyethylene, high density polyethylene, etc. Polyolefines, such as polypropylene and ethylene- α olefin copolymerization resin; An ethylene copolymer for example, ethylene-unsaturated-carboxylic-acid copolymer; ionomer; ethylene-methyl-acrylate copolymers, such as an ethylene-acrylic-acid copolymer (EAA) and an ethylene-methacrylic-acid copolymer (EMAA), — An ethylene-ethyl-acrylate copolymer (EEA), ethylene-(meta) acrylic ester copolymers [, such as an ethylene-methyl-methacrylate copolymer,]; — ethylene-vinylacetate copolymer (EVA); —; polypropylene modified resin, such as an ethylene-vinylalcohol copolymer, etc. is mentioned.

[0017] As vinyl acetate system resin, a polyvinyl acetate and vinyl acetate-(meta) acrylic ester copolymer, a vinyl acetate-vinyl ester copolymer, a vinyl acetate-maleate copolymer, etc. are mentioned, for example.

[0018] As thermoplastic elastomer, for example SIS (styrene-isoprene-styrene block copolymer), SBS (styrene-butadiene-styrene block copolymer), SEBS (styrene-ethylene-butylene-styrene block copolymer), SEPS (styrene-ethylene-propylene-styrene block copolymer), SEP (Styrene-ethylene-propylene block copolymer) etc. — styrene thermoplastic elastomer (styrene system block-copolymer; for example, styrene system block copolymer of 5 % of the weight or more of styrene contents); — polyurethane system thermoplastic-elastomer; — Thermoplastic elastomer polyester; blend system thermoplastic elastomer, such as a polymer blend of polypropylene and EPT (ternary system ethylene-propylene rubber), etc. is mentioned.

[0019] As a tackifier, petroleum resin (aliphatic series petroleum resin, aromatic series petroleum resin, alicycle group petroleum resin that carried out hydrogenation of said aromatic series petroleum resin), rosin system resin, terpene system resin, styrene resin, cumarone indene system resin, etc. are mentioned, for example. These tackifiers are independent, or they can be used, combining them two or more sorts. In addition, since it is melting-ized at an elevated temperature when extruding the adhesives layer 2 and forming by lamination, the point of stability over oxidation to especially alicycle group petroleum resin is desirable.

[0020] While taping workability improves by making the adhesives layer 2 contain a tackifier, stability and good adhesive strength are obtained to package base materials, such as a carrier tape.

[0021] the loadings of a tackifier — the base polymer 100 weight section — receiving — for example, 2 – 50 weight section — it is 5 – 30 weight section extent preferably. When the loadings of a tackifier are under 2 weight sections and paper is used as a support base material 1, the fused adhesives constituent will not need to paste up with this paper base 1 (anchoring nature is not obtained), but will need to prepare an interlayer by not a mere extrusion lamination but the co-extrusion, or tandem extrusion lamination. Moreover, an adhesive property with a carrier tape (paper carrier) becomes is hard to be acquired.

[0022] On the other hand, when the loadings of a tackifier exceed 50 weight sections to the base polymer 100 weight section, there is a possibility that blocking may occur and stable production may become impossible between the rolls which touch the adhesives layer 2 and this adhesives layer 2 immediately after extrusion. Moreover, packaging goods—ed, such as a chip, adhere to the adhesives layer 2, and it becomes easy to generate poor air jet hole adsorption in a circuit board production process. Furthermore, in using this laminating tape as a top covering tape, for remarkable lifting of adhesive strength, the proper adhesive strength of 10–70gf (98.1–687mN) is exceeded, and the easy-releasability at the time of exfoliation becomes is easy to be spoiled.

[0023] Although it will not be limited especially if it is the polymer which has antistatic nature as a macromolecule mold antistatic agent, carboxylate radical content polymers, such as polyamide system copolymers, such as for example, a polyether ester amide, and a potassium ionomer, a

example. As for a macromolecule mold antistatic agent, it is desirable that pyrolysis temperature is 120 degrees C or more in order to prevent deterioration by the heat in the case of taping etc. [0024] the loadings of a giant-molecule mold antistatic agent — the base polymer 100 weight section — receiving — for example, the 1 – 150 weight section — it is 20 – 120 weight section extent preferably. By adding a macromolecule mold antistatic agent in the adhesives layer 2, it continues at a long period of time, and high antistatic nature is obtained. For example, the surface resistivity of the adhesives layer 2 can be preferably made into 109–1012ohms / ** extent below 1013ohms / ** (for example, 108–1013ohms / ** extent).

[0025] When there are few loadings of a macromolecule mold antistatic agent, surface resistivity exceeds 1013ohms / **, and we are anxious about chip adhesion in the adhesives layer 2 by static electricity.

[0026] as a bulking agent — inorganic powder — it can be used — as the typical example — for example, hydroxides [, such as an oxide; aluminum hydroxide,],, such as carbonate; silica impalpable powder, such as a calcium carbonate and a magnesium carbonate, a zinc oxide, and tin oxide, — in addition to this, a sulfate, a silicate, a borate, a titanate, etc. are mentioned. in order to make it contribute to the hardness of the adhesives layer 2 as loadings of a bulking agent — the base polymer 100 weight section — receiving — for example, the 5 – 100 weight section — it is 10 – 80 weight section extent preferably.

[0027] The reason which adds a bulking agent in the adhesives layer 2, and is hardened is as follows. That is, in the resin (paste) which constitutes the adhesives layer 2 from this invention when adhesives layer 2 the very thing changes into a superfluous softening condition and is stuck by pressure with an iron etc., for example at the time of taping, if it remains as it is in order to blend a tackifier with the adhesives layer 2 overflowing, or using paper for the support base material 1 and using it as a bottom product covering tape, the strike-through phenomenon in which said resin oozes out arises from a paper rear face. And a paste adheres to an iron etc., a continuation taping activity becomes impossible, or a chip etc. adheres to the adhesives layer 2 by insertion of (a halt of a taping machine), a chip, etc., and forcing by the air jet hole in the case of drawing (at the time of handling), or it originates in storage environment (temperature, humidity), and the nonconformity of a chip etc. adhering to the adhesives layer 2 arises. On the other hand, if a bulking agent is blended with the adhesives layer 2, the adhesive property of the adhesives layer 2 will be controlled moderately, and the above-mentioned nonconformity will be canceled.

[0028] If the loadings of a bulking agent exceed the 100 weight sections to the base polymer 100 weight section, the adhesion of the adhesives layer 2 and the support base material layer 1 will fall, and it will become easy to produce demerits, such as a poor appearance (a pinhole, maldistribution) and adhesive strength lowering. Moreover, if there are too many loadings of a bulking agent, it will extrude by it with the moisture adsorbed when the ingredient which surface resistivity is not necessarily improved more and has especially hygroscopicity was used, and will sometimes foam, and it becomes easy for workability — a pinhole occurs — to fall, and is easy to become still more disadvantageous also from the field of cost.

[0029] When using the laminating tape of this invention as for example, a top covering tape, a top covering tape must be exfoliated at the time of chip drawing, and it is required that the adhesive strength at this time should have variation in proper range called 10–70gf (98.1–687mN) few. Moreover, when it exfoliates, little fuzz of a carrier tape (paper carrier) is wanted for there to be. Such a property can be satisfied with the above-mentioned base polymer, a tackifier, and a macromolecule mold antistatic agent in the adhesives layer 2, and can make a surfactant satisfy by the proper thing to do for amount combination in addition to a bulking agent. The loadings of this surface active agent are 0 – 10 weight section extent for example, to the base polymer 100 weight section.

[0030] Moreover, in said adhesives layer 2, additives, such as an antioxidant, a softener, an ultraviolet ray absorbent, a rust-proofer, a coupling agent, an antistatic agent except said, and a cross linking agent, may be added if needed. Although the thickness of the adhesives layer 2 can be suitably chosen in the range in which neither an adhesive property nor handling nature is

[0031] In this invention, since the adhesion of both layers is raised between said support base material layers 1 and adhesives layers 2, an interlayer can also be prepared in it. This interlayer can consist of thermoplastics, such as for example, polyolefine system resin, thermoplastic elastomer, rubber, etc. These components are independent, or two or more sorts can use them, mixing.

[0032] The thing of said instantiation can be used as polyolefine system resin and thermoplastic elastomer. As rubber, synthetic rubber, such as NR(natural rubber);IR (polyisoprene rubber), SBR (styrene butadiene rubber), BR (butadiene rubber), CR (chloroprene rubber), NBR (nitrile rubber), EPR (duality system ethylene-propylene rubber), EPT (ternary system ethylene-propylene rubber) and IIR (isobutylene isoprene rubber), acrylic rubber, polyurethane rubber, acid denaturation elastomers (carboxyl group denaturation elastomer etc.), and an epoxy group denaturation elastomer, is mentioned, for example.

[0033] Although an interlayer's thickness can be suitably chosen in the range which does not spoil the handling nature when considering as a laminating tape etc., generally it is about 5-30 micrometers.

[0034] The laminating tape of this invention can be manufactured by laminating without minding through an interlayer on the support base material layer 1 by the single of common use of the thing which carried out the melt blend and pelletized the constituent of the adhesives layer 2 with the biaxial kneading machine to the predetermined blending ratio of coal, or the thing which carried out dryblend, or the tandem extrusion laminating method. Moreover, on the support base material layer 1, the laminating of the adhesives layer 2 and the interlayer can be carried out by co-extrusion lamination, and they can also be manufactured.

[0035] In this way, the laminating tape obtained can be suitably used as packing materials at the time of conveying chip mold electronic parts, such as resistors, such as a chip fixed resistor, and a stacked type ceramic condenser, (for example, a top covering tape, a bottom product covering tape, etc.) etc.

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EXAMPLE

[Example] Hereafter, although this invention is explained more to a detail based on an example, this invention is not limited at all by these examples.

[0038] The example 1 low-density-polyethylene (LDPE) (base polymer, trade name "Myra Son 16P", Mitsui Chemicals, Inc. make) 100 weight section, the alicycle group system petroleum resin (product made from tackifier and trade name "Al Cong P-125" Arakawa Chemical industry) 15 weight section, the calcium-carbonate (bulking agent, trade name "super S", Maruo Calcium Co., Ltd. make) 50 weight section, and the polyether ester amide (macromolecule mold antistatic-agent, trade name "PERESUTATTO 2450", Sanyo Chemical Industries, Ltd. make) 75 weight section On Japanese paper (a support base material, thickness of 30 micrometers), the melting constituent which carried out the melt blend with the biaxial kneading machine was extruded so that thickness might be set to 30 micrometers with a single extrusion laminator, and the laminating tape was obtained.

[0039] The example 2 low-density-polyethylene (LDPE) (base polymer, trade name "Myra Son 16P", Mitsui Chemicals, Inc. make) 100 weight section, the alicycle group system petroleum resin (product made from tackifier and trade name "Al Cong P-125" Arakawa Chemical industry) 8 weight section, the calcium-carbonate (bulking agent, trade name "super S", Maruo Calcium Co., Ltd. make) 17 weight section, and the potassium ionomer (giant-molecule mold antistatic-agent, Made in "trade name SD 100" Mitsui DEYUPON poly chemical) 42 weight section On Japanese paper (a support base material, thickness of 30 micrometers), the melting constituent which carried out the melt blend with the biaxial kneading machine was extruded so that thickness might be set to 30 micrometers with a single extrusion laminator, and the laminating tape was obtained.

[0040] On Japanese paper (a support base material, thickness of 30 micrometers), example of comparison 1 low density polyethylene (LDPE) (a trade name "Myra Son 10P", Mitsui Chemicals, Inc. make) was extruded so that thickness might be set to 30 micrometers with a single extrusion laminator, and the laminating tape was obtained.

[0041] After having extruded example of comparison 2 low density polyethylene (LDPE) (a trade name "Myra Son 10P", Mitsui Chemicals, Inc. make) on Japanese paper (a support base material, thickness of 30 micrometers) so that thickness might be set to 30 micrometers with a single extrusion laminator, and forming an adhesives layer, corona discharge treatment of this adhesives layer front face was carried out, and further, the cation system antistatic agent (a trade name "SAT-4", Nippon Junyaku make) was applied, it dried in the kiss roll coating machine, and the laminating tape was obtained.

[0042] The following trials were performed about each laminating tape obtained in the assessment trial example and the example of a comparison. The result is shown in a table 1. (Adhesive strength) After using the heat seal machine (taping machine by Tokyo Wells) and carrying out the heat seal of each laminating tape to the front face of a paper carrier (the Hokuetsu Paper Mills, Ltd. make, HOCTO-60) on condition that 170 degrees C, iron presser-foot force 1.5kgf (14.7Ns), and 1200 PCS/min, adhesive strength was measured using the friction test machine on a part for 300mm/in exfoliation rate, and conditions with an exfoliation include angle of about 180 degrees.

[0043] (Surface resistivity 1) The surface resistivity of each laminating tape was measured on the conditions for 500Vx 30 seconds under the ambient atmosphere of 23 degrees C / 65%RH using high resistivity meter Huy Lester UP (Mitsubishi Chemical make).

(Surface resistivity 2) The surface resistivity of each laminating tape was measured on the conditions for 500Vx 30 seconds under the ambient atmosphere of 23 degrees C / 30%RH using high resistivity meter Huy Lester UP (Mitsubishi Chemical make).

[0044] (Half-life) JIS L Based on 1094, the half-life by the side of the adhesives layer of each laminating tape was measured in static ONESUTO meter. In addition, a half-life electrifies a tape front face and means time amount until the electrical potential difference reaches the value of the one half of initial voltage.

(Friction band electrical potential difference) JIS L Based on 1094, the friction band electrical potential difference by the side of the adhesives layer of each laminating tape was measured.

[0045] (Chip deposit efficiency) the adhesives layer and chip of each laminating tape are contacted — making — 60 degrees C — 10 minutes — warming — it asked for the rate to which the chip adhered the back. In addition, it examined using 50 chips per one test piece.

(Rate 1 of mounting) It asked for the rate which has adsorbed the chip (1005 types) [500PCS/1 test piece] taped on each laminating tape by the air jet hole when applying to a mounting machine after room temperature neglect.

(Rate 2 of mounting) It asked for the rate which has adsorbed the chip (1005 types) [500PCS/1 test piece] taped on each laminating tape by the air jet hole when applying to a mounting machine after neglect for five days on condition that RH 40 degrees C / 92%.

[0046]

[A table 1]

表 1

		実施例 1	実施例 2	比較例 1	比較例 2
テープ特性	総厚さ (μm)	58	60	55	56
	接着力 (N/5.25mm幅)	1.57	1.67	1.96	1.08
	表面抵抗率 1 (Ω/□)	3×10^{10}	6×10^{10}	$>1 \times 10^{14}$	6×10^9
	表面抵抗率 2 (Ω/□)	5×10^{11}	8×10^{11}	$>1 \times 10^{14}$	7×10^{12}
	半減期 (秒)	1	1	1200以上	1以下
	摩擦帯電圧 (V)	12	22	2000	30
	チップ付着率 (%)	0	0	15	20
実装率 1 (%)		100.0	100.0	99.8	100.0
実装率 2 (%)		100.0	100.0	99.6	99.6

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the outline sectional view showing an example of the laminating tape for packing materials of this invention.

[Description of Notations]

1 Support Base Material Layer

2 Adhesives Layer

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DRAWINGS

[Drawing 1]



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